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IS 400 (1968): the National Flag of India (Wool Khadi) [ TXD  
8: Handloom and Khadi ]

**“ज्ञान से एक नये भारत का निर्माण”**

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“Invent a New India Using Knowledge”



**“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”**

Bhartṛhari—Nītiśatakam

“Knowledge is such a treasure which cannot be stolen”





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IS : 400 - 1968

## *Indian Standard*

### SPECIFICATION FOR THE NATIONAL FLAG OF INDIA ( WOOL KHADI )

*( Second Revision )*

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INDIAN STANDARDS INSTITUTION  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

Gr 4

*October 1968*

*Indian Standard*

**SPECIFICATION FOR  
THE NATIONAL FLAG OF INDIA  
(WOOL KHADI)**

*(Second Revision)*

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THE NATIONAL FLAG OF INDIA  
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**0. FOREWORD**

**0.1** This Indian Standard (Second Revision) was adopted by the Indian Standards Institution on 17 August 1968, after the draft finalized by the National Flag of India Sectional Committee had been approved by the Textile Division Council.

**0.2** This standard was first published in 1951 and was revised in 1964 with a view to changing over completely the dimensions in metric system subsequent to its adoption by the Government of India. In the revised standard the details of yarn for warp and weft of wool khadi bunting and of cotton khadi duck were deleted, the dimensions of hemp cordage and those of wooden toggles used for different sizes of flags were amended, and the pH value of the aqueous extract of bunting and tolerances on the dimensions of the flag and Asoka Chakra were prescribed.

**0.3** The dimensions of flags specified in the first revision of the standard were the exact equivalents of the non-metric values specified in the first version of the standard. In the present revision, the dimensions of flags have been expressed in rationalized metric values. This opportunity has also been taken to amend:

- i) method of attaching the panels of the flags: (a) in order to make the panels of equal widths on both sides of the flags, and (b) for positioning the Chakra, exactly in the centre of the white panel on both the sides; and

ii) tolerances on the dimensions of the flag and the Chakra.

**0.4** This standard contains clauses 8.1, 9.3, 9.5 and 9.6(b) which call for agreement between the buyer and the manufacturer.

**0.5** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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\*Rules for rounding off numerical values (revised).

## 1. SCOPE

**1.1** This standard prescribes the design, constructional details and other particulars of the National Flag of India made of hand-spun and hand-woven wool khadi bunting.

## 2. DESIGN

**2.1** The flag shall be rectangular in shape and the ratio of the length to the width shall be 3 : 2.

**Note** — However, if required for special purposes, flags having length to width ratio different from 3 : 2, may be made.

**2.2** The flag shall be a tricolour panel made up of three rectangular panels or sub-panels (*see Note*) of equal widths. The colour of the top panel shall be India saffron (*KESARI*), and that of the bottom panel shall be India green; the middle panel shall be white, bearing at its centre the design of Asoka Chakra in navy blue colour.

**Note** — Sub-panels are small pieces which are used to make up the width of the panel. In case of large-size flags, it often happens that the width of the cloth available is not sufficient for constituting a single panel; in such cases, pieces of cloth of smaller widths may be attached together to get the required width of the panel. The sub-panels shall be attached together by lapped seam with the raw edges turned in.

## 3. MATERIALS

### 3.1 Wool Khadi Bunting

**3.1.1 Yarn** — Hand-spun woollen yarn shall be used in the manufacture of bunting. The approximate count of yarn shall be as given below:

Warp	45 tex × 2 (Nm 22/2)
Weft	67 tex × 2 (Nm 15/2)

**Note** — To convert universal count, in tex, to metric count divide 1000 by the universal count.

**3.1.2 Cloth** — The bunting shall be woven on handlooms in plain weave. The particulars of bunting shall be as given in Table 1.

**3.1.2.1** The bunting meant for manufacturing the top and bottom panels shall be bleached and dyed in India saffron (*KESARI*) and India green respectively and that meant for the middle panel shall be bleached. The dyed pieces shall be free from dyeing defects, such as uneven dyeing and streakiness.

**3.1.2.2** The colours of the flag, that is, India saffron (*KESARI*), India green and navy blue, shall correspond, when visually examined in ordinary daylight to the colours in the sealed standard flag held in the custody of the Chief Inspector, Chief Inspectorate of Textiles & Clothing, Kanpur.

**NOTE** — Spectrophotometric values of the white, India saffron (*KESARI*) and India green colours in the flag presented to the Constituent Assembly on 22 July 1947 were measured by the then Technical Development Establishment Laboratory (Stores), Kanpur, using the illuminant C as specified by the International Commission on Illumination, 1931 and found to be as follows:

Colour	Trichromatic Values			Brightness, Percent
	X	Y	Z	
White	0.813	0.819	0.868	72.6
India saffron ( <i>KESARI</i> )	0.598	0.360	0.102	21.5
India green	0.288	0.395	0.317	8.9

It is intended that the flags made to conform to this standard should have colours approximating as closely as possible to the colours as defined above. For all practical purposes, however, correspondence to the sealed standard flag shall be considered adequate.

For the purpose of controlling production, sample pieces of bunting dyed to the standard colours [India saffron (*KESARI*), India green and navy blue] may be obtained at nominal cost from the Indian Standards Institution.

**TABLE 1 PARTICULARS OF WOOL KHADI BUNTING**  
(*Clause 3.1.2*)

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST
i)	Ends/dm	102 ± 4	7.1 of IS : 1963-1961*
ii)	Picks/dm	90 ± 8	7.2 of IS : 1963-1961*
iii)	Weight, g/m <sup>2</sup>	290 ± 15	7.2 of IS : 1964-1961†
iv)	Breaking load on 150 × 200 mm strips, kg, Min:		
	Warp	64	8.1.2 and 9 of IS : 1969-1961‡
	Weft	59	

\*Method for determination of ends and picks per unit length in woven fabrics. (Since revised).

†Method for determination of weight per square metre and weight per linear metre of fabrics. (Since revised).

‡Method for determination of breaking load and elongation at break of woven fabric (by constant-rate-of-traverse machine). (Since revised).

**3.1.2.3** The colour fastness ratings and other requirements of bunting shall be as given in Table 2.

### 3.2 Cotton Khadi Duck — used for the sleeve of the flag.

**3.2.1 Yarn** — The yarn used in the manufacture of duck shall be hand-spun from clean carded cotton. The approximate count of yarn for warp and weft shall be 38 tex × 3 (or Nm 26/3).

**NOTE** — To convert universal count in tex to metric count divide 1 000 by the universal count.

**TABLE 2 REQUIREMENTS OF WOOL KHADI BUNTING**  
(Clause 3.1.2.3)

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST
i)	Colour Fastness to: Light ( see Note )	6 or better	IS : 686-1957* or IS : 2454-1967† IS : 687-1966‡ IS : 690-1956§
	Washing	4 or better	
	Sea water	5 or better	
ii)	pH Value	6.0 <i>Min</i> 7.5 <i>Max</i>	Cold Method of IS : 1390-1961
iii)	Dimensional changes: Warpway Weftway	3 percent, <i>Max</i> 2 percent, <i>Max</i>	IS : 665-1962¶

**NOTE** — In case of dispute, colour fastness to light shall be determined by the method given in IS : 686-1957\*.

\*Method for determination of colour fastness of textile materials to daylight.

†Method for determination of colour fastness of textile materials to artificial light (xenon lamp).

‡Method for determination of colour fastness of textile materials to washing; Test I (revised). (Since revised).

§Method for determination of colour fastness of textile materials to sea water.

||Methods for determination of pH value of aqueous extracts of textile materials.

¶Method for determination of relaxation shrinkage of woven fabrics containing wool.

**3.2.2 Cloth** — The duck shall be woven on handlooms in plain weave. It shall be used in the scoured state and shall conform to the requirements of Table 3.

**TABLE 3 REQUIREMENTS OF COTTON DUCK**

SL No.	CHARACTERISTIC	REQUIREMENT	METHOD OF TEST
i)	Ends/dm	158 ± 4	7.1 of IS : 1963-1961*
ii)	Picks/dm	134 ± 12	7.2 of IS : 1963-1961*
iii)	Weight, g/m <sup>2</sup>	355 ± 35	7.1 of IS : 1964-1961†
iv)	Breaking load on 50 × 200 mm strips, kg, <i>Min</i> :		
	Warp	48	8.1.2 and 9 of
	Weft	49	IS : 1969-1961‡

\*Method for determination of ends and picks per unit length in woven fabrics. (Since revised).

†Method for determination of weight per square metre and weight per linear metre of fabrics. (Since revised).

‡Method for determination of breaking load and elongation at break of woven fabric (by constant-rate-of-traverse machine). (Since revised).

### 3.3 Sewing Thread

**3.3.1** Sewing threads used for all machine stitching shall conform to Variety No. 15 of IS:1720-1960\* [ 16 tex  $\times$  2  $\times$  3 (36s/2/3) ], the colour of the sewing thread being same as that of the panels on which it appears.

**3.3.2** For sewing hemp cordage inside the sleeve, sewing thread conforming to Variety No. 19 of IS:1720-1960\* [ 27 tex  $\times$  3  $\times$  3 (22s/3/3) ] shall be used.

### 3.4 Hemp Cordage

**3.4.1** The cordages of various sizes shall conform to the requirements given in Table 4.

**TABLE 4 REQUIREMENTS OF HEMP CORDAGE**

NOMINAL SIZE (CIRCUMFERENCE)	NUMBER OF STRANDS IN THE CORDAGE	NOMINAL LINEAR DENSITY*	BREAKING LOAD ON ONE METRE TEST LENGTH, Min
(1) mm	(2)	(3) k tex	(4) kg
19	3	25	150
25	3	32	300
32	3	64	355
38	3	105	590

\*Linear density in kilotex ( k tex ) = the number of kilograms per kilometre.

**3.4.2** Breaking load of the cordage shall be determined by the method prescribed in Appendix A.

### 3.5 Wooden Toggles

**3.5.1** Wooden toggles shall be made from well-seasoned timber. Following species of timber are recommended for making the toggles:

TRADE NAME	BOTANICAL NAME
Haldū	<i>Adina cordifolia</i> Hook.f.
Padauk	<i>Pterocarpus dalbergioides</i> Roxb.
Shisham	<i>Dalbergia latifolia</i> Roxb.
Sal	<i>Shorea robusta</i> Gaertn.f.
Teak	<i>Tectona grandis</i> Linn.f.

**3.5.2** The size of wooden toggles used for various sizes of flags shall be in accordance with the applicable requirements of Table 5 ( see col 10 to 14 ) read with Fig. 1.

\*Specification for cotton sewing thread, bleached or dyed. ( Since revised ).

**TABLE 5 DIMENSIONS OF THE FLAG AND WOODEN TOGGLE**

(Classes 3.5.2, 4.1, 5.2, 5.4 and 5.5, and Fig. 1, 2 and 3)

All dimensions in millimetres.

FLAG SIZE No.	LANCE WIDTH or HMS	DEPTH OF HMS	SLEEVE	Dimensions of Hemp Cordage and Loop			Wooden Toggle Dimensions						
				A	B	C	D	E	Length			Groove	
									L	M	N		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
1	6 300	4 200	25	65	40	38	65	140	125	30	22	15	14
2	3 600	2 400	15	50	40	32	65	130	105	25	17	7	12
3	2 700	1 800	15	45	40	25	65	120	90	20	13	5	10
4	1 800	1 200	15	40	40	19	65	110	75	17	10	4	8
5	1 350	900	15	40	40	19	65	110	65	17	10	4	8
6	900	600	15	40	40	19	65	110	65	17	10	4	8
7	225	150	—	15	—	—	—	—	—	—	—	—	—
TOLERANCE percent			$\pm 1.5$	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$	$\pm 2$
percent			percent	percent	percent	percent	percent	percent	percent	percent	percent	percent	percent

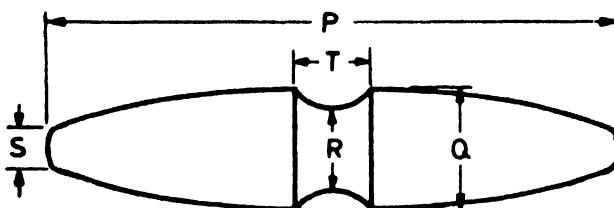


FIG. 1 DETAILS OF WOODEN TOGGLE

#### 4. FLAG

**4.1 Size** — The finished flags of different sizes shall conform to the applicable requirements of Table 5 (*see col 2 and 3*) and shall be designated as that size. The other dimensions of flags, such as width of sleeve, depth of hem, hemp cordage and loop shall be in accordance with the applicable requirements of Table 5 read with Fig. 2 and 3.

**4.2 Flags of Size No. 1 to 6** shall be manufactured from one layer of bunting; those of Size No. 7 (for motor cars) shall be manufactured from two layers of bunting.

**4.3 Asoka Chakra** — The Asoka Chakra shall preferably be screen printed, or otherwise printed or stencilled or suitably embroidered with navy blue colour embroidery thread conforming to Variety No. 7 of IS : 1803-1961\*. In all the cases, the Chakra shall be completely visible on both sides of the flag in the centre of the white panel.

**4.3.1** The dimensions of the Asoka Chakra on different sizes of flags shall be in accordance with the requirements of Table 6 read with Fig. 4.

#### 5. CONSTRUCTION

**5.1** For all machine stitching, that is, stitching raw edges, attaching the panels, sleeve and corner pieces to the flag, etc, lock-stitches shall be used. The number of stitchings shall be not less than 6 per centimetre.

**5.2** The panels of flags of Size No. 1 to 6 shall be attached by stitching them as shown in Fig. 2. A tolerance of  $\pm 2$  mm shall be permitted in the depth of lapped seam of the panels (which is 10 mm) (*see section XX of Fig. 2*). Except along one of the widths, the raw edges along three sides of the flag shall be turned over twice and stitched to form a hem as shown in Fig. 2. The depth of hem shall be in accordance with the applicable requirement of Table 5 (*see col 4*). Along the other width, a sleeve (*see 3.2*) shall be attached.

\*Specification for cotton embroidery thread, bleached or dyed.

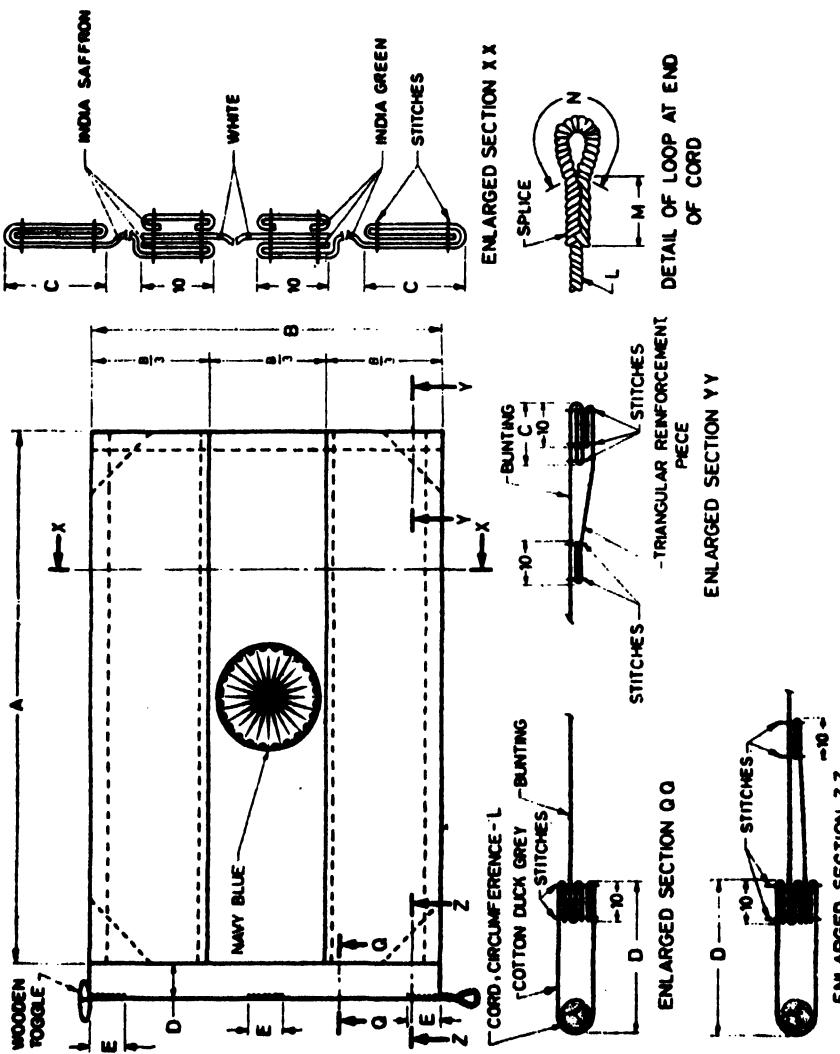


FIG. 2 CONSTRUCTIONAL DETAILS OF THE NATIONAL FLAG (WOOL KHADI)  
All dimensions in millimetres.

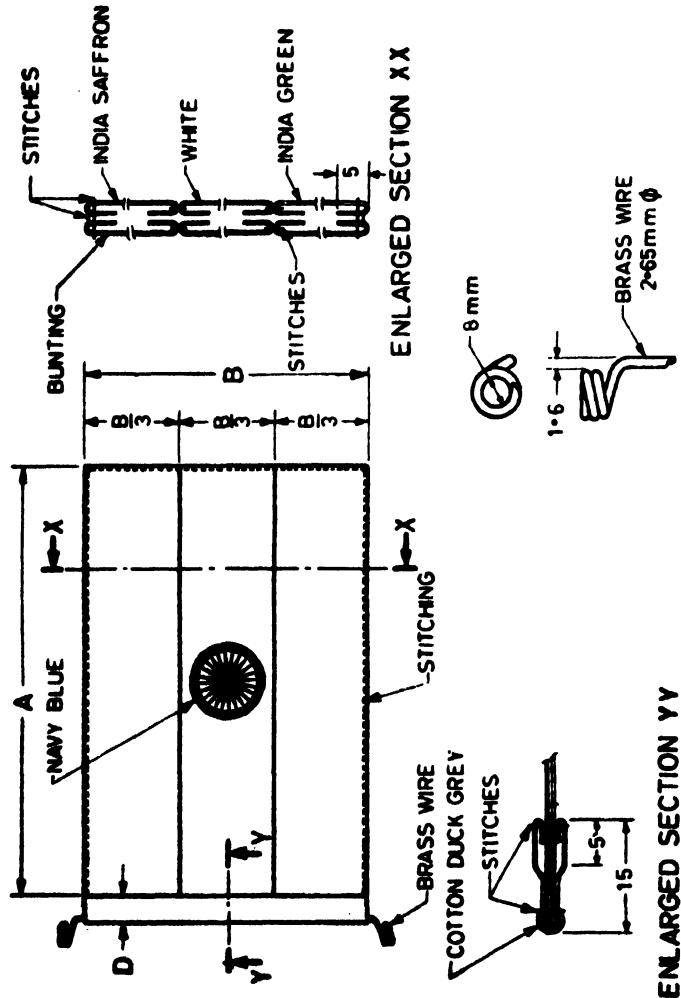


FIG. 3 CONSTRUCTIONAL DETAILS OF THE NATIONAL FLAG  
(Wool Khadi) FOR MOTOR CAR

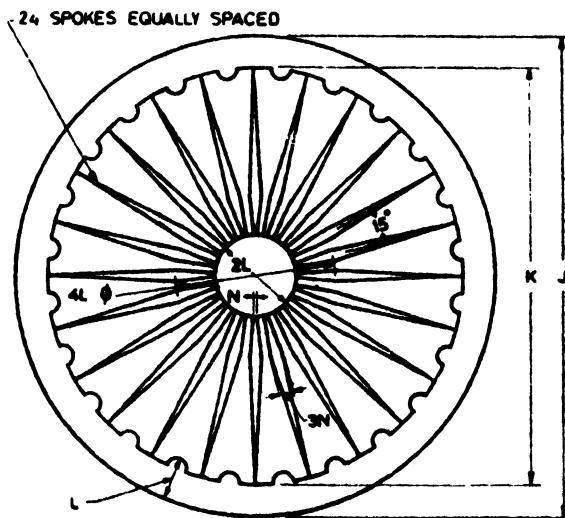
**TABLE 6 DIMENSIONS OF ASOKA CHAKRA**

(Class 4.3.1)

All dimensions in millimetres.

FLAG SIZE No.	J	K	L	N (NOMINAL)
(1)	(2)	(3)	(4)	(5)
1	1 295	1 120	112	14
2	740	640	64	8
3	555	480	48	6
4	370	320	32	4
5	280	242	24	3
6	185	160	16	2
7	40	35	9.5	0.4

Tolerance       $\pm 2$  percent or  $\pm 0.5$  mm whichever is more

**FIG. 4 DESIGN OF ASOKA CHAKRA**

**5.2.1** The panels of flags of Size No. 7 (for motor cars) shall be attached by stitching them as shown in Fig. 3. Except along one of the widths, the raw edges along three sides shall be turned in once to a depth of 5 mm and shall be stitched as shown in Fig. 3.

**5.3 Reinforcements** — The four corners of flags of Size No. 1 to 6 shall be reinforced with triangular pieces of bunting of the same construction and colour as is used for making the flags.

**5.4 Sleeve** — A sleeve shall be provided along that side of the flags where the raw edge has not been stitched. The width of the sleeve of flags shall

be in accordance with the applicable requirement of Table 5 (*see* col 5), read with Fig. 2 and 3.

**5.5 Hemp Cordage** — In flags of Size No. 1 to 6, a hemp cordage (*see* 3.4) shall be inserted in the sleeve and shall be hand-stitched at three places, that is, top, middle and bottom of the sleeve as shown in Fig. 2. It shall have spliced-in loops, one at the top for the toggle and the other at the bottom. The dimensions of the cordage used for flags of Size No. 1 to 6 shall be in accordance with the applicable requirements of Table 5 (*see* col 7 to 9).

**5.5.1 Brass Wire** — Flags of Size No. 7 shall be provided with a brass wire of 2.65 mm diameter as shown in Fig. 3.

**5.6 Toggle** — A toggle (*see* 3.5) shall be attached to each flag at the top (except for flags of Size No. 7) by splicing the hemp cordage around it before sewing the latter inside the sleeve.

## 6. SEALED SAMPLE

**6.1** All flags made to this standard, besides satisfying the requirements of the standard, shall be in general conformity with the sealed standard National Flag of India (wool khadi) held in the custody of the Chief Inspector, Chief Inspectorate of Textiles & Clothing, Kanpur.

## 7. MARKING

**7.1** Flags shall be marked on the sleeve with the following:

- a) Flag Size No.,
- b) Length × width in millimetres,
- c) Manufacturer's name or trade-mark,
- d) Year of manufacture, and
- e) Any other information required by the buyer.

**7.1.1** The flags may also be marked with the ISI Certification Marks.

**Norm** — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 8. PACKING

**8.1** Flags shall be packed as agreed to between the buyer and the seller.

## 9. SAMPLING AND CRITERIA FOR CONFORMITY

9.1 In any consignment all national flags of the same size shall constitute a lot.

9.2 The conformity of a lot to the requirements of this standard shall be determined on the basis of tests carried out on samples selected from the lot.

9.3 Unless otherwise agreed upon between the buyer and the manufacturer, a certain number of flags depending upon the size of the lot shall be selected at random from the lot. The number of such flags shall be in accordance with col 1 and 2 of Table 7.

**TABLE 7 NUMBER OF FLAGS TO BE SELECTED FROM A LOT AND PERMISSIBLE NUMBER OF NON-CONFORMING FLAGS**

[*Clauses 9.3 and 9.6(a)*]

NUMBER OF FLAGS IN THE LOT	NUMBER OF FLAGS TO BE SELECTED	PERMISSIBLE NUMBER OF NON-CONFORMING FLAGS
(1)	(2)	(3)
Up to 25	3	0
26 .. 50	5	0
51 .. 100	8	0
101 .. 150	13	0
151 .. 300	20	1
301 .. 500	32	1
501 .. 1,000	50	2
1,001 .. 3,000	80	3
3,001 and above	125	5

9.3.1 While selecting the flags from the lot, same number of flags, as far as possible, shall be selected from each package in the lot.

9.4 All flags selected as in 9.3 shall be tested for dimensions of flags, requirements of Asoka Chakra, construction of flags and size of wooden toggles.

9.5 For the purpose of determining requirements of cotton khadi bunting, colour fastness of dyed and printed pieces of bunting, pH value, shrinkage, requirements of cotton duck and sewing thread and the breaking load of hemp cordage, the method of sampling and determining conformity of a lot shall be as agreed to between the buyer and the manufacturer. The tests for these requirements may be conducted on the materials before fabricating the flags, or alternatively, sufficient quantity of the materials of the same quality as that which were used for manufacturing the flags shall be supplied along with the manufactured flags by the manufacturer for the purpose of these tests.

9.6 Criteria for Conformity — A lot shall be considered as conforming to this standard, if:

- a) in respect of requirements enumerated in 9.4, the number of observed values failing to satisfy each of these requirements does not exceed the applicable number specified in col 3 of Table 7; and

- b) in respect of requirements enumerated in 9.5, the criteria for conformity as agreed to between the buyer and the manufacturer is satisfied.

## A P P E N D I X A

(Clause 3.4.2)

### METHOD FOR DETERMINATION OF BREAKING LOAD OF HEMP CORDAGE

#### A-1. ATMOSPHERIC CONDITIONS FOR TESTING AND CONDITIONING OF TEST SAMPLE

**A-1.1** The test shall preferably be carried out in a standard atmosphere at  $65 \pm 2$  percent relative humidity and  $27 \pm 2^\circ\text{C}$  temperature (see also IS : 196-1966\*).

**A-1.2** Prior to test, the test sample shall preferably be conditioned in the standard atmosphere or the prevailing atmosphere where the test is to be carried out for 48 hours.

#### A-2. APPARATUS

**A-2.1** The sample shall be tested on a constant-rate-of-traverse horizontal-type of rope strength testing machine (preferably power-driven) provided with two jaw grips. The distance between the two jaw grips shall be adjusted to one metre and the speed of the moving jaw shall be between 150 and 300 mm/min.

#### A-3. PROCEDURE

**A-3.1** Fix a length of the cordage under test in the jaws of the machine. Apply a tension equal to 3 percent of the breaking load specified in Table 4 for the cordage of the corresponding size. Increase the load gradually and continuously until the specimen breaks. Read off the breaking load of the specimen.

**A-3.2** Repeat the test with the remaining test specimens.

**A-3.3** Calculate the average ( $\bar{X}$ ) and the range ( $R$ ) from the observed values of breaking load.

#### A-4. REPORT

**A-4.1** Report the lot to be in conformity with the requirements of Table 4 in respect of breaking load, if the value of the expression  $\bar{X} - 0.4R$  is greater than or equal to the specified minimum value.

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\*Atmospheric conditions for testing (revised).

## INTERNATIONAL SYSTEM OF UNITS ( SI UNITS )

### Base Units

QUANTITY	UNIT	SYMBOL
Length	metre	m
Mass	kilogram	kg
Time	second	s
Electric current	ampere	A
Thermodynamic temperature	kelvin	K
Luminous intensity	candela	cd
Amount of substance	mole	mol

### Supplementary Units

QUANTITY	UNIT	SYMBOL
Plane angle	radian	rad
Solid angle	steradian	sr

### Derived Units

QUANTITY	UNIT	SYMBOL	DEFINITION
Force	newton	N	1 N = 1 kg.m/s <sup>2</sup>
Energy	joule	J	1 J = 1 N.m
Power	watt	W	1 W = 1 J/s
Flux	weber	Wb	1 Wb = 1 V.s
Flux density	tesla	T	1 T = 1 Wb/m <sup>2</sup>
Frequency	hertz	Hz	1 Hz = 1 c/s (s <sup>-1</sup> )
Electric conductance	siemens	S	1 S = 1 A/V
Electromotive force	volt	V	1 V = 1 W/A
Pressure, stress	pascal	Pa	1 Pa = 1 N/m <sup>2</sup>

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Gangotri Complex, Bhadbhada Road, T.T. Nagar	BHOPAL 462008	0 27 10
22E Kalpana Area	BHUBANESHWAR 751014	5 30 27
5-8-56C L. N. Gupta Marg	HYDERABAD 500001	22 10 88
R 14 Yudhisther Marg, C Scheme	JAIPUR 302009	6 98 32
117/418 B Sarvodaya Nagar	KANPUR 208005	4 72 92
Patliputra Industrial Estate	PATNA 800013	6 28 08
Hantek Bidg (2nd Floor), Rly Station Road	TRIVANDRUM 565001	32 27